

No. Publication No.

Title

1. 05 - 091550(1993) METHOD OF LOADING PROGRAM

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CLAIMS

[Claim(s)]

[Claim 1] In the technique of changing and carrying out loading of the program of the data processor which has RAM to a new program from an old program (a) The content of the aforementioned old program and the aforementioned new program is compared per address. A program is created. the case of being different -- the address and content -- a new program **** -- extracting -- the difference -- (b) -- this -- the difference -- the loading technique of the program characterized by changing the old program of the aforementioned data processor into a new program by carrying out loading of the program to the aforementioned RAM

[Claim 2] online -- a data processor -- the difference -- the loading technique of the program according to claim 1 characterized by sending out a program

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] this invention relates to the loading technique of the program to RAM in data processors, such as a telephone switchboard.

[0002]

[Description of the Prior Art] Conventionally, loading of the program in a data processor was performed by carrying out loading of the whole program. Therefore, loading of all the programs after changing, when a part of program needs to be changed was carried out.

[0003]

[Problem(s) to be Solved by the Invention] However, there was a trouble where loading of a program took time, by the aforementioned conventional loading technique. When especially a public line was used and data communication performed loading of a program, in connection with a prolonged circuit hold and it, there was also a trouble of the increase in phonecall charges.

[0004] this invention solves the trouble about the loading time of the program described above, the amount of loading of a program is made into the minimum, and it aims at offering the loading technique of the program which can shorten loading time.

[0005]

[Means for Solving the Problem] the case where this invention compares the content of an old program and a new program per address (step unit) in the technique of changing and carrying out loading of the program of the data processor which has RAM to a new program from an old program, and it is different in order to solve the aforementioned trouble -- the address and content -- a new program **** -- extracting -- the difference -- a program -- creating -- the difference -- it constituted by carrying out loading of the program to RAM so that the old program of a data processor may

[0006]

[Function] the case where compare the content of an old program and a new program per address (step unit), and it is different since this invention constituted the loading technique of a program as mentioned above -- the address and content -- a new program **** -- extracting -- the difference -- a program -- creating -- the difference -- the old program of a data processor is changed into a new program by carrying out loading of the program to RAM Therefore, when a part of program has change, loading only of the content of the address with the change is carried out.

[0007]

[Example] Hereafter, it explains in detail, referring to a drawing about the example of this invention. explanatory drawing showing the loading technique of the program which drawing 1 requires for the example of this invention -- it is -- the difference, such as a personal computer, -- the case where there is a compare difference per address about the content of the new program file 1 and the old program file 2 by the programming means 3 -- the address and content -- a new program **** -- extracting -- the difference -- a program file 4 is created and the difference -- loading of the content of a program file 4 is carried out to RAM5

[0008] Drawing 2 is a memory block diagram of new and an old program in the 1st example of this invention, and it is shown that the content of new and an old program differs in the addresses 4515C [2000 and] 332. therefore, the difference -- the program file 4 is edited in the form of the content of the address 2000, the content of a new program and the address 4515, the content of a new program and the address C332, and a new program

[0009] the new program on the memory indicated to be an old program on the memory which drawing 3 is a memory block diagram of new and an old program in the 2nd example of this invention, and is shown in (a) to (b) -- comparing -- the difference -- only d is extracted And the address on memory is given to the extracted difference d, and it is made the program configuration shown in (b) by carrying out loading to the data processor of the program configuration shown in (a). In this example, since it is vacant between modules and there is memory, even if it changes into the module with more number of steps than the module of an old program, it is vacant, the increment of a number of steps is absorbed by memory, and it is not affected to the module not more than it. thereby -- the difference -- the loading time of a program can be shortened

[0010] the system configuration view showing the loading technique of the program which drawing 4 requires for the 3rd example of this invention -- it is -- each telephone switchboard 6-1 from the down-load pin center, large 8, - 6-n -- the difference -- a program is downloaded on-line drawing -- setting -- each telephone switchboard 6-1 - 6-n -- periodical -- the down-load pin center, large 8 -- a telephone network 7 -- minding -- the news from automatic -- carrying out -- the difference -- a program is received by the half-duplex contention method Since the communication procedure with the down-load pin center, large 8 is memorized by ROM of the telephone switchboard 6-1 - 6-n, all the program fields in RAM can be rewritten. the case where it is operating by the program of the number of versions from which the telephone switchboard 6-1 - 6-n are different -- each exchange -- receiving -- the difference -- the difference which the down-load pin center, large 8 leads the number of the program versions which each telephone switchboard 6-1 - 6-n are using before downloading, and is downloaded when downloading a program -- the case where a program can apply to the telephone switchboard, or it can judge and apply -- as long as -- it downloads

[0011] In addition, this invention is applicable to the general data processor which has not only a telephone switchboard but RAM although the above-mentioned example is an example in the case of carrying out loading of the program to a telephone switchboard. Moreover, this invention is not limited to the above-mentioned example, and based on the meaning of this invention, various deformation is possible for it and it does not eliminate them from the domain of this invention.

[0012]

[Effect of the Invention] as mentioned above -- according to [as explained in detail] this invention -- the difference -- since it constituted so that loading of the program might be carried out, the following effect is done so

(1) The loading time at the time of program exchange can be shortened. Therefore, when downloading to many data processors, time until program exchange of all equipments is completed can be shortened.

(2) Since the holding time of the telephone line used by down load is shortened, a cost falls.

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Field

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Technique

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Effect

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TECHNICAL PROBLEM

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MEANS

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OPERATION

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EXAMPLE

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[0011] In addition, this invention is applicable to the general data processor which has not only a telephone switchboard but RAM although the above-mentioned example is an example in the case of carrying out loading of the program to a telephone switchboard. Moreover, this invention is not limited to the above-mentioned example, and based on the meaning of this invention, various deformation is possible for it and it does not eliminate them from the domain of this invention.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is explanatory drawing showing the loading technique of the program concerning the example of this invention.

[Drawing 2] It is the memory block diagram of new and an old program in the 1st example of this invention.

[Drawing 3] It is the memory block diagram of new and an old program in the 2nd example of this invention.

[Drawing 4] It is the system configuration view showing the loading technique of the program concerning the 3rd example of this invention.

[Description of Notations]

1 New Program File

2 Old Program File

3 the difference -- a programming means

4 the difference -- a program file

5 RAM

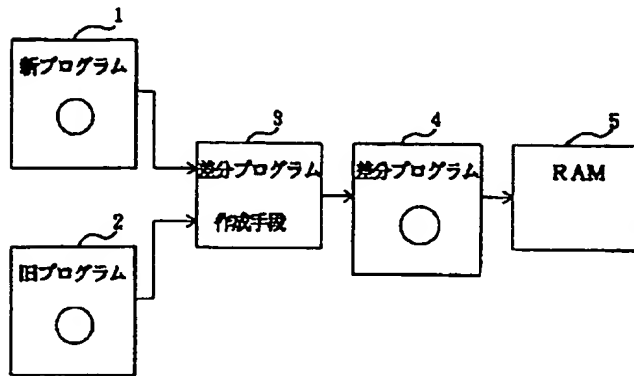
6-1 - 6-n Telephone switchboard

7 Telephone Network

8 Down-Load Pin Center, large

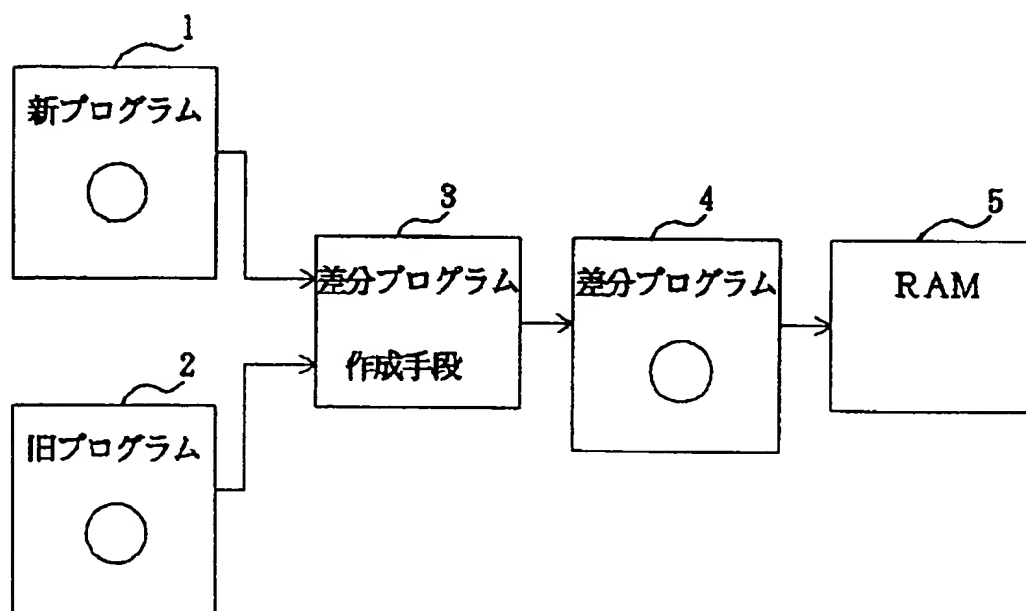
[Translation done.]

Drawing selection ▼



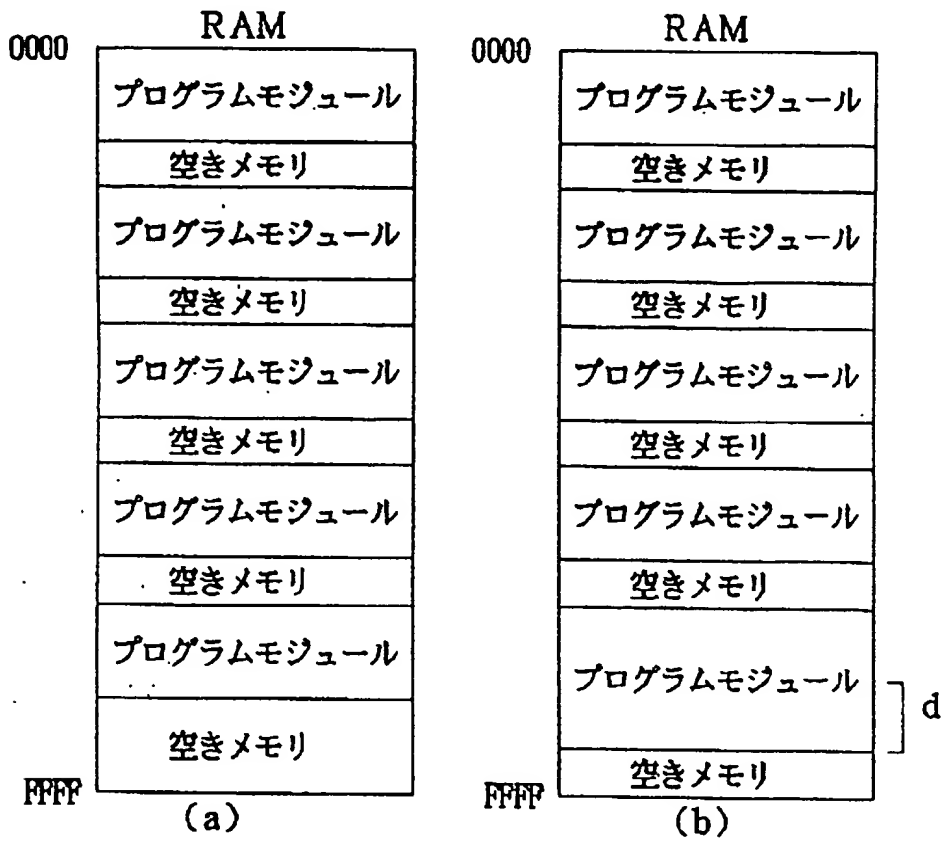
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Drawing selection



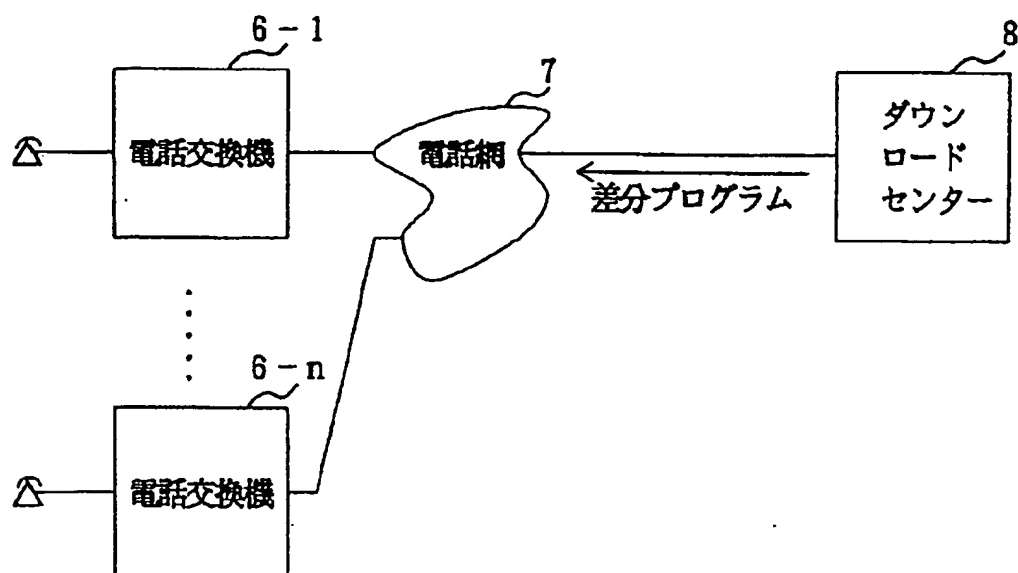
[Translation done.]

Drawing selection ▼



[Translation done.]

Drawing selection Drawing 4 ▼



[Translation done.]

PATENT ABSTRACTS OF JAPAN

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(21)Application number : 03-251929

(71)Applicant : OKI ELECTRIC IND CO LTD
NIPPON KOSOKU TSUSHIN KK

(22)Date of filing : 30.09.1991

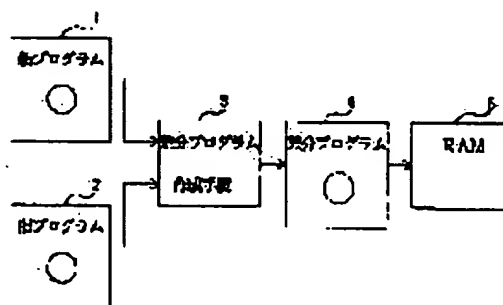
(72)Inventor : OYA KENJI
HAYANO MIKIO
TAKEDA KAZUMASA
URYUHARA MAKOTO

(54) METHOD OF LOADING PROGRAM

(57)Abstract:

PURPOSE: To minimize the loading quantity of programs and to shorten a loading time by loading a difference program.

CONSTITUTION: The contents of a new program file 1 are compared with that of an old program file 2 in each address by a difference program forming means 3 such as a personal computer, and a difference exists between both the contents, the address concerned and its contents are extracted from the file 1 to form a difference program file 4. Then the contents of the file 4 are loaded to a RAM 5. It is preferable to send a difference program to a data processor by means of an on-line. Consequently the loading quantity of programs can be minimized and the loading time at the time of substituting programs can be shortened. In the case of loading down programs to many data processors, time to be required for completing program substitution in all the processors can be shortened.



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[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]